

## METHOD AND SYSTEM FOR GENERATION AND HOMODYNE DETECTION

### TECHNICAL FIELD

5           This invention relates to generation and reception of microwave signals during instantaneous measurement of position and shift of mobile elements especially of rotor units of working turbo-machines during true-time operation.

### BACKGROUND

          Accomplishment of already known method exploits the principle of  
10   synchronous reception described in "Microwave homodyne systems" by R.J. King, P. Peregrinius LTD, IEE London, 1978. According to this method, the part of power from one generator transmitted by separate microwave channel is compared in detector system with signal from slotted section.

          Already known system contains Gunn diode seating connected through  
15   collinear arm with magic tee and then by second collinear arm with detection diode seating. Microwave antenna is connected to magnetic magic tee arm and comparative channel is connected to electric magic tee arm.

          Both already known method and system make generation and homodyne detection impossible in extremely hard environmental conditions with  
20   temperature reaching several hundred degrees centigrade and dynamic pressure as a vibro-acoustic noise reaching about 160 dB. Neither already known method nor system enables operational inspection in such environmental conditions.

### SUMMARY OF THE INVENTION

          The method of this invention comprises selection of equal value of both  
25   electrical channels between shunt arm in waveguide T-connection and generation diode in one collinear arm and in the second collinear arm between the same shunt arm and detection diode. This means compliance of condition of proper phase location between generation and detection elements.

          The system in this invention includes coupling between generating diode  
30   seating and detection diode seating by waveguide T- connection (tee).

Method and system of this invention enables operational inspection in each environmental conditions and also enables extending interpretation possibilities of the measurement results.

#### DETAILED DESCRIPTION

5           According to the method, for generation, transmission, reception, and homodyne detection in the range of microwave frequency it is important to ensure the selection of equal value of both electrical channels between shunt arm in waveguide T-connection, and generated diode in one collinear arm, and in the  
10       a compliance condition of proper phase location between generation and detection elements is achieved which is requested for technical embodiment of a microwave homodyne set.

          The system is shown in the Figure as a bloc diagram. Generation diode seating 1 is connected through collinear arm 2 with coaxial waveguide T-connection 3 and then by collinear arm 4 with detection diode seating 5.  
15       Microwave antenna 6 connected to shunt arm of waveguide T-connection 3 radiates and receives signal reflected from inspected object 7.

          Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes  
20       may be made in form and detail without departing from the spirit and scope of the invention.